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The Home Economist

Formerly Food and Health Education

Dr. LOUISE STANLEY

FEBRUARY, 1928

Iva B. Pasco
Elizabeth McDonald
Rose J. Hogue
Philip K. Reynolds
Katherine Cornell
Margaret C. Lambert

DOMESTIC SCIENCE TODAY includes a knowledge of Smoothtop

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Cooking chart . . . .

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GAS RANGES

THE HOME ECONOMIST

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Published monthly by THE AMERICAN FOOD JOURNAL, Inc., Floral Park, N. Y. Entered as second-class matter December 31, 1923, at the Post Office at Floral Park, N. Y., under the Act of March 3, 1879. Copyright, 1928 by THE AMERICAN FOOD JOURNAL, Inc. All rights reserved. Publication Office, Floral Park, New York; Business and Editorial Offices, 468 Fourth Avenue, New York City.

Vol. VI, No. 2 **10c a copy** **$1.00 a year**

In "The Good Old Days"

WHEN women had to use wood-burning stoves, they had also to hoe the garden and milk the cow. Now they turn on the gas or gasoline, buy their vegetables, fresh or in cans, from the grocer, and have purer, safer, richer milk on the pantry shelf than our grandmothers had when every family kept a cow.

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Let us send you our "Eating for Efficiency" and "Tested Recipes" containing quantity recipes and other free booklets demonstrating the adaptability of Evaporated Milk to every cream and milk use.

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THE HOME ECONOMIST

Health Education in the Public Schools of Syracuse

Showing the Excellent Results Obtained from a Five Year Health Demonstration Project

By IVA B. PASCO
Assistant Supervisor of Health Education

Mistress Mary Quite Contrary
What is it makes you grow?
"Lots of milk, butter and whole wheat bread,
Eggs, oatmeal and apples red
And vegetables, all in a row!"

EVERY child has a right to have a strong mind and body. The right kind of food will help give him these. A well nourished child has not only the right weight for his age, but also has strong straight bones, sound teeth, good color, firm flesh, good digestion and a clear mind. He is full of pep, has a happy disposition and is not susceptible to disease. Syracuse aims for happier and healthier children every year.

In 1923 the Milbank Memorial Fund chose Syracuse as the urban center to be assisted in carrying on a five year health demonstration. The following agencies then existing, were selected to carry on this experiment: the City Health Department, the Onondaga Health Association, the Division of Health Education of school children of the Department of Public Instruction.

Prior to the advent of the demonstration work, Syracuse was much interested in the health of its school children. The staff of physicians and nurses then employed give statistics which show that the cost in the grammar schools for Health Service was approximately $1.18 per pupil. The staff at that time included one part-time supervisor of School Health work, nine school physicians, one supervising nurse, eleven school nurses, and two dentists.

The Health Service staff has been greatly increased during the last five years, due to the assistance given by the Milbank Fund. There is now one Director of School Health work, two full time and nine part-time school physicians, two dental hygienists, two dentists, one psychiatric social worker, one psychiatrist, one refractionist, one orthopedist, one tuberculosis specialist, one ear specialist, one supervisor of Health Education with assistant. This added staff has increased the cost of this service in the elementary and high schools from $1.18 to $2.72 per pupil. At the present time with the exception of the specialists for tuberculosis, hearing and vision, the assistant in Health Education and the psychiatric social workers, all of the above people are now employed by the Board of Education.

The Health Education program in the schools deals entirely with preventive rather than curative measures. It is

TEACHING HEALTH THROUGH THE "MOVIE"

A group of kindergarten children gathered around the teacher, who is showing them some of the pictures on a miniature movie. "The Good Breakfast" reel is the one used in the picture. This is a very excellent method of imparting subject matter to kindergarten and primary children

sincerely hoped that if due emphasis is placed on good health habits and right food practices, the next generation, if not the present one, will be a much healthier and happier people.

A graded outline of work for the year has been placed in the hands of each teacher. This comprises suggestions for morning inspection, health facts which we wish to be emphasized during the term, as well as devices and methods of presentation. A group of health rhymes and slogans, and also a short playlet is included in the course of study. This term each teacher of grades from second to fifth inclusive, has been asked to give at least one short health playlet. Dramatization plays a very important part in the Health Education program of the primary grades.

"LITTLE VEGETABLE PEOPLE" A SECOND GRADE PLAY

Dramatization plays a very important part in the Health Education program of the primary grades

The sixth grade teachers, for their special project were requested to have their classes send in some original health verses. The following are three samples of these:

Old Mother Hubbard
Went to the cupboard
To get her children some food.
No flies were there,
It was dusted with care,
And all the food was wholesome and good.

Old King Cole was a merry old soul,
A merry old soul was he.
He called for his orange
And he called for his milk.
And he called for his apples three.

Johnny had to go to bed,
And with castor oil be fed.
"The reason is because," he said,
"With vegetables I was not fed."

It is impossible to visit every teacher in each school more than two or three times a year, as there are now 38 grammar schools with about 560 teachers. In order to measure up the work of the various schools and teachers, we have established the custom of office nights for teachers or "open house" twice a week, from four to five o'clock. At this time the teachers may come for advice, suggestions, plays, rhymes, songs, etc., as they need. We have arranged a bulletin board showing different phases and methods used in health teaching throughout the city. This gives those, who do come for help, a chance to see what someone else is doing and to glean new ideas. We have been greatly pleased with the response of the teachers to this request.

Correlation of health work with all other subjects is one of our aims. The state law only allows twenty minutes a week for health and hygiene work and it is difficult to even find a place in the over-crowded programs for that short time. As this is true, we feel that far better results are gained by introducing health wherever possible throughout the other work.

In the three lower grades where we have no health books, we have found supplementary readers more adaptable. A chart showing the page, with a possible health suggestion in the various reading books, was included in the outline of these grades.

The new third grade geography syllabus correlates with health throughout the year. A geography health supplement, containing food and health facts which touch on each of the topics in the syllabus, has been compiled in our office and is now ready for distribution to the third grade teachers.

English and language work affords excellent opportunity for introducing health. Compositions, sometimes illustrated, letters and original verses are the main channels through which health is introduced in this phase of correlation. Below you will find an example of both composition work and letter writing which followed a health lesson.

HEALTH

"To be healthy we must eat cereals. There are different kinds of cereals. Some have coats, some are without the coats. If we want to be healthy we must eat cereals with the coats on. The cereals with coats on are called the whole cereals. These cereals contain iron and lime which he'p to build strong teeth and bones."

"We must be careful in choosing the right kind of cereals. Some of the whole cereals are puffed wheat, cornmeal, wheatena, shredded wheat and oatmeal."

319 Park Street,
Syracuse, N. Y.

Dear mother:

I wish you would have spinach more often, about three times a week. I know I can have a glass of milk any time I want it, but make me drink it whether I want it or not. Have these foods more often: oranges, which I love, oatmeal, a little butter, a little cheese and whole wheat bread. I don't like eggs so don't give me any. Give some to Bill, though. Give everybody in the family more milk and food that has more milk in it.

Your loving son,
Bob.

The supervisor of drawing has been most co-operative. Projects emphasizing health work have been delightfully worked out. The second grades make a booklet on "A Good Breakfast" which includes the drawing and coloring of fruit, cereal, toast and milk. The third grades also make a booklet on "What I Do Before I Go to School," which helps to emphasize our morning inspection. The higher grades have made some excellent posters on nearly every phase of health work.

Last year, due to the splendid co-operation of the Vocational Director, we were able to have a small wooden frame made, which we call the "Movie." This device is 11 in. x 14 in. and is made of light wood. There are rollers at the top and bottom which enables one to show a continu-

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Fundamentals of Electric Refrigeration

How Electricity is Used for Preservation of Food

By KATHERINE CORNELL
Home Service Department, Kelvinator, Inc.

THE subject of household refrigeration has been brought to the attention of the public by the popularity of the electric refrigerator which automatically maintains temperatures necessary for the preservation of foods.

Since the subject is so timely and because the readers of this magazine are passing on to their students important facts about foods and their preservation, they will want to be informed about electric refrigeration. It is hoped that this article will give them sufficient information to build up a proper presentation of the subject for their individual requirements.

That the whole field of refrigeration is receiving wide consideration is evidenced by the fact that many and varied research projects are being undertaken and that many educational programs for better household refrigeration are being carried on.

The United States Department of Agriculture announces that a study of household refrigeration is to be made by its Bureau of Home Economics in cooperation with the National Association of Ice Industries and the Society for Electrical Development, acting for several manufacturers of electric refrigerators.

The dean of the home economics department of one of our state universities recently said: "The importance of refrigeration in the home is just beginning to be understood. Because homemakers should understand the importance of a proper storage place for perishable foods and the importance of temperatures on foods, we teach the principles of refrigeration in several departments."

The chief purpose of refrigeration is to prevent food spoilage by checking the growth of micro-organisms—yeasts, molds and bacteria.

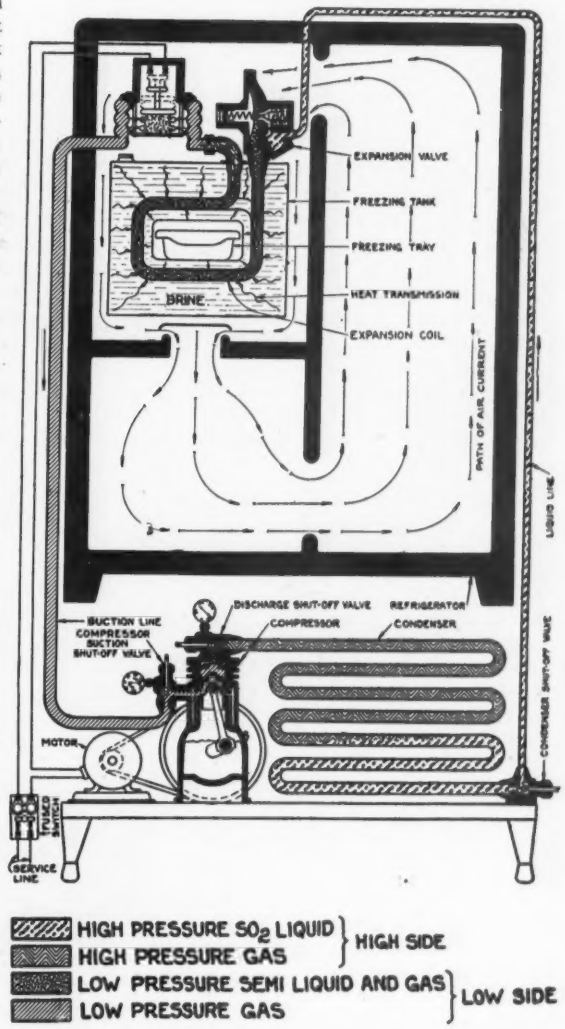
The Department of Agriculture states that the temperature of the compartment in which food is stored must always be kept at 50 degrees or less if rapid growth of harmful micro-organisms is to be avoided. It is the function, then, of the refrigerator to provide a storage space for food at a temperature always below 50 degrees. The problem of refrigeration is how to remove heat from the refrigerator (because cold is merely the absence of heat) and how to keep it out.

Heat always flows from an object of higher temperature to one of lower temperature. In order to cool a hot pudding, the cook sets it out in a shaded spot where the breeze is blowing; the heat from the hot food moves out into the cooler air, and it keeps moving out until the pudding is as cold as the air.

Exactly the same principle works in a refrigerator. The air is the medium which carries the heat units from the food to the ice (the refrigerant). The ice is colder than the air within the refrigerator. Then, because heat naturally passes from the warmer air to a cooler object, the warmed air is cooled as it passes over the ice. The air is now colder than the food, and the heat units pass from the food to the air, increasing the warmth of air and cooling the food. The warmed air rises to the top of the food compartment, and comes in contact with the ice again, and more heat units pass from the air to the ice, cooling the air. The cooled air drops to the bottom of the food compartment; absorbs heat from the food, and as it becomes heat laden again, it rises through the food compartment; and so on around the circle again. (See illustration for proper distribution of food in the cabinet.) But each time the warmed air passes over the ice, and the ice absorbs its heat, the piece of ice melts and becomes smaller so that it is not able to hold the temperature of the cabinet continually below 50 degrees.

Now the problem is to put a cooling medium into the refrigerator which will always remain the same size to maintain the proper circulation of air in the cabinet; that will continually absorb enough heat units to maintain an even temperature; and that will remove excessive moisture from the air.

For centuries man has known that food could be cooled by placing it in contact with ice or snow. It was noticed that during the process the ice and snow changed to water, but it was not until Lord Kelvin, the great English scientist, made his experiments with heat during the middle of the last century that science understood why ice always melts as it cools outside substances. In exploring this field of science Lord Kelvin discovered the basic principles governing re-



The diagram above shows the course of the refrigerant through its complete cycle. The physical forms of the refrigerant at various points in the cycle are indicated by the shading

frigeration, and made possible the entire modern industry of mechanical refrigeration.

Lord Kelvin's discoveries established: (1) that when any substance changes its form from a solid to a liquid, or from a liquid to a gas, it absorbs heat from its surroundings; and (2) that when it changes its form from a gas to a liquid, or from a liquid to a solid, it gives off heat.

Following Lord Kelvin's principles, the problem then was to find the way to put a refrigerant into a refrigerator and control it so that it would give a cooling object which automatically would maintain a constant temperature range, and which would not require replenishing from time to time.

This refrigerant in a suitable container must be a substance which changed its form from a solid to a liquid or from a liquid to a gas, at a temperature lower than the normal temperature of the food and air in the box. After much experimentation, the largest manufacturers of electric refrigerators decided on sulphur dioxide gas (SO_2) as the most suitable refrigerant.

The electric refrigerator plant is made up of three principal parts; the motor and compressor; the cooling unit with its automatic control, and the refrigerator.

The cooling unit or evaporator takes the place of a piece of ice, as the warmed air in the refrigerator passes over it, its heat is absorbed. This cooled air drops to the bottom of the refrigerator and makes a circle just as it does in an iced refrigerator.

Practically all refrigerating machines used in the United States today, either for commercial or for domestic purposes, are operated on the gas compression system.

The evaporating or cooling unit is placed in the ice compartment of any standard refrigerator (in a remote installation) or it is a built-in feature when an entirely new electric refrigerator (cabinet model) is used.

The remote type of installation requires special wiring and piping. The cabinet model may be plugged into any electric outlet.

The condensing unit is placed in the basement or other convenient place for a remote installation, and in the bottom of the cabinet in a cabinet model.

The evaporating unit includes:

1. Evaporator
2. Admission valve for the sulphur dioxide
3. Automatic controller
4. Storage tank (where one is used)

The condensing unit includes:

1. Compressor
2. Condenser
3. Motor

In addition, there are the tubes through which the refrigerant passes from one unit to the other.

We know that the temperature in the refrigerator must never go over 50 degrees; likewise it must not drop so low that the food will freeze. Therefore, the automatic control is usually set to produce a temperature range of between 42 and 48 degrees.

Now we are ready to trace the cycle of the refrigerant (sulphur dioxide) through the electric refrigerator and understand how automatic refrigeration is accomplished.

The warmed air passes over the evaporating coils or brine tank (where one is used) and as the heat is absorbed by the liquid sulphur dioxide in the coils, this liquid is changed to sulphur dioxide gas (Kelvin's Law). Just as soon as the liquid sulphur dioxide in the evaporating coils is changed to sulphur dioxide gas, it is no longer of service as a cooling medium and must be drawn out of the coils so that more liquid sulphur dioxide may be admitted to the coils to be ready to absorb heat.

It is the first function of the compressor, which is operated by the electric motor, to pump this warmed sulphur dioxide gas out of the evaporating coils. At the same time the warm air passes over the evaporating coils it passes over the automatic control. The automatic control signals to the

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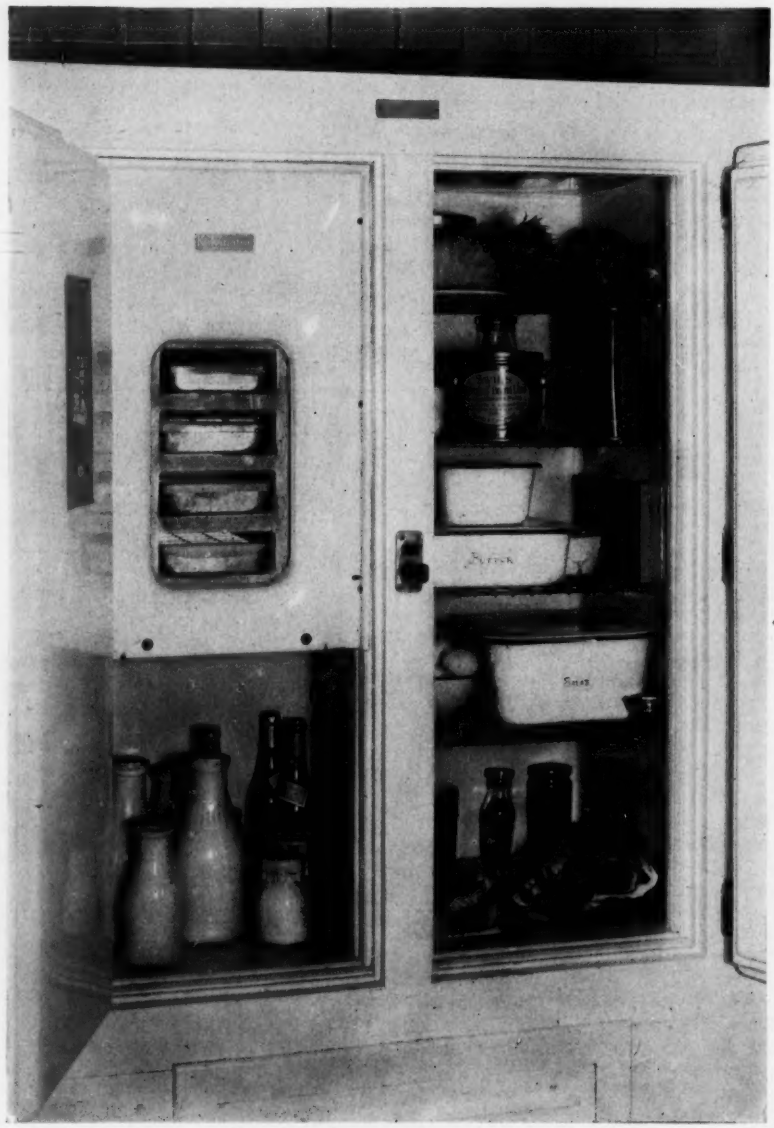

Proper arrangement of food in an electric refrigerator so that foods requiring the lowest temperatures are placed in the coldest part of the food compartment

EDITORIAL

IN announcing the death of Winifred Stuart Gibbs, THE HOME ECONOMIST wishes to pay tribute to an able woman who gave a real contribution to the world.

Miss Gibbs devoted herself enthusiastically and unselfishly to improving the nutrition habits of people in all walks of life.

For the last five years she edited THE AMERICAN FOOD JOURNAL and THE HOME ECONOMIST and wrote syndicate articles on food subjects which appeared in numerous newspapers.

She carried on her work actively to within a very few weeks of her death which occurred on February 8th.

Born in New York, the daughter of George Holman Gibbs and Catherine Stuart Karnes Gibbs, she was educated in the Chicago schools and at the University of Rochester, obtaining a diploma from the Rochester Mechanics Institute in 1901.

Miss Gibbs founded the home economy department of the New York Association for Improving the Condition of the Poor, and trained home economics students at Teachers College. Later she advised workers in this field in various cities.

She was a delegate to the Brussels congress in 1909 to consider questions of home education and was a consultant to the National War Labor Board. She was connected with the Federation for Child Study from 1919 to 1922 and had been in food and health education work since.

Miss Gibbs was a member of the American Association for the Advancement of Science, the American Home Economics Association, the Internation Congress for the Rational Feeding of Man and the American Public Health Association.

She belonged to the Arts Club in Washington and to the Nations Arts and Query Club here. Among her books were "Minimum Cost of Living" and "The Children's Book of Food Verses."

We, with whom Miss Gibbs was associated, and the many manufacturers and individuals who came in contact with her, deeply mourn her loss.

IN VIEW of the fact that there is an increasing amount of Home Economics research being done, we feel that we are particularly fortunate in being able to offer you Doctor Louise Stanley's views on the opportunities in that field. This article is the fifth in our series of "Chapters from the Lives of Leaders," each of which deals with a different phase of Home Economics work, written by a recognized authority in that field. This series was conceived with the underlying thought of giving to the younger home economics women of today something of the inspiration, and the thrill that attaches to personal contact with those who have made home economics a living force.

Doctor Stanley's place as Chief of the Home Economics Department of the United States Bureau of Agriculture, makes her message a particularly valuable one to students who are considering research work as their future field of endeavor. And all of us who have the interests of the Home Economics movement at heart will do well to digest these words of Dr. Stanleys. "Home Economics is not a single subject, but a field of knowledge. It draws upon the basic sciences and organizes them around the solutions of home problems. The field subdivides itself into definitely separated aspects of homemaking as food, clothing, housing, child training, and adjustment of relationships within the home, and the economics or managerial aspect which may be developed separately or as a part of the other groupings. Certain basic sciences contribute more to one field than another, but there is considerable overlapping."

There are two short articles by students of Marshall College in West Virginia, showing how they have worked out their health and nutrition programs for the lower grammar school grades. We believe that teachers and students are benefited by such an exchange of experiences and will always be glad to receive accounts of how you have worked out classroom projects, or of any interesting piece of work you have done. Won't you tell us about them—and through us pass on to others the value of your own experiences?

SPEAKING of health education and experimental work, we must make mention of the campaign against rickets being waged by the Mulberry Health Center, an Activity of The New York Association for Improving the Condition of the Poor. Mulberry Health Center is situated in a crowded district in the lower section of the city, a district that has a very high infant death rate, much higher than New York City, or the United States Registration Area. One fourth of all these deaths are caused by pneumonia.

It is believed that rickets causes a susceptibility to colds, bronchitis and pneumonia and since rickets is almost universal among infants, it is hoped that by reducing the prevalence of rickets the high infant sickness and death rate can also be reduced.

The plan of campaign in Mulberry Health Center is to teach every mother and father in the district that rickets is a harmful and needless disease—that its prevention is simple and much to be desired. To do this they prepared posters to be displayed in store windows and other available places, flyers with short, definite messages to be distributed periodically in every home in the district and a pamphlet telling the story of rickets and its prevention for use of teachers and others. Slides to be shown one week out of each month in the moving picture houses in and near the district—a short film to be used in group work are also being used.

Work was begun during the week of October 17th, 1927 and will continue for a period of two years. This work consists of house to house visits, groups at the health center and talks outside to groups already organized.

The material used is available to other agencies desiring to use it in their district.

Information may be had by writing to the Supervisor at Mulberry Health Center, 256 Mott Street, New York City.

WILL you help the new editor by sending her suggestions as to the type and kinds of material you are most interested in? Also, if you have been doing any interesting or original work in developing class room projects, won't you write in and tell her about them?

Home Economics in Michigan

How This Progressive State Views Home Economics as a Whole

By ROSE J. HOGUE

Head of Home Economics Department, Central State Teachers College, Mt. Pleasant, Michigan

AS in other states most of the teachers including those in Home Economics are on duty as early as the last of August in Michigan.

All of us look forward to meeting and greeting each other at the district meetings of the Michigan State Teacher's Association. Our Michigan Home Economics Association holds its annual meetings at the different district meetings. The officers for the past year were: president, Jessie Walton, Kalamazoo; vice-president, Minnie Irons; secretary, Carol Davis, Highland Park; treasurer, Ruby Anderson; councilor, Lulu Becker; alternate, Marie Dye. This fall the State Association meeting was held in Jackson, October 21st and 22nd. The following new officers were elected: vice-president, Ruth Schumacher, Kalamazoo, W. S. T. C.; secretary, Elizabeth Creighton, Flint (City Supervisor); councilor, Minnie Irons, East Lansing, M. S. C.

The following was the program at Jackson:

9:00 A. M. West Intermediate School, Room 60. "Home Economics in Business and Its Relationship to the School," Jean K. Rich, Director of Nutritional Education, American Institute of Baking, Chicago.

10:00 A. M. Business Meeting.

10:30 "Echoes from Asheville." Jessie Walton, President M. H. E. A.

11:00 "Sanitation and Food Control as Practiced by the State Board of Agriculture." W. C. Geagley, Pure Foods Division, State Dept. of Agriculture, Lansing.

Saturday, October 22, 1927

President—Jessie Walton, City Supervisor, Kalamazoo.

9:00 A. M. West Intermediate School, Room 60. "Some High Spots in Home Economic Research." Ereminah D. Jarrard, Northern High School, Detroit.

9:45 State Business Meeting.

10:30 Round Table Discussions: Family Relationships—Leader, Irma Gross, Practice House, Michigan State College.

SUGGESTED TOPICS:

1. How and where can a teacher obtain suitable information for teaching this unit?

2. How can the Social Aspects of Family Life be woven into different phases of Home Economics class work?

Child Welfare—Leader, Catherine Miller, Nursery School, Michigan State College.

Suggested Topics:

1. What facts are suitable to include in the different grades of Home Economics where this work is offered?

2. New Methods of Child Training.

Textiles — Chairman, Julia Tear, Clothing Dept., Michigan State College.

Suggested Topics:

1. What shall we teach about the use of Rayon?

2. What kind and how much note book work should be done in a High School Clothing Class.

3. How can Field Trips and Reports be made worth while in teaching Textiles?

12:00 Home Economics Luncheon.

A TEACHER training committee consisting of the members of the Home Economics Education Department of the colleges in the state meets twice a year to work on subjects of common interest. Our state supervisor, Miss Ruth Freegard, is a valuable and helpful member of this committee. A conference was held at Western State Teachers College, Kalamazoo, in January, and a second one at Central State Teachers College, Mt. Pleasant, in May. At the latter a report was given on plans for grading outlines of duties and responsibilities of student teachers. Outstanding points of the Central Regional Conference held in Chicago were presented and discussed.

The home economics meeting at the time of the Schoolmaster's Club in the spring is always well attended One of the speakers this year was Dr. Sundwall of the University of Michigan who talked on public health as it affects home economics.

The extension work in Michigan is quite outstanding. Mrs. Louise Campbell in Michigan State College, East Lansing, Michigan, is the state home demonstration leader.

Home Economics Extension—Michigan State College.

Home Economics Extension work is being conducted this year in forty-five counties in the Southern Peninsula, by Home Demonstration Agents and Specialists. Several other counties have asked for home demonstration work but can not be served this year due to the lack of Home Economics Extension instructors.

THE Home Economics Extension staff now consists of one State Leader, two Assistant State Leaders, five Home Demonstration Agents, and eight Specialists. This year two new specialists have been added to the staff, a Nutrition Specialist and a Specialist to assist in organization and general Home Economics Extension work.

The local leader plan has proven to be a successful one in Michigan. The women who have been elected leaders have been very cooperative and have carried the message of the Home Demonstration Agents and Specialists back to their groups in a very efficient manner.

One of the features of the summer's work was the camp for rural women. Camps of a week's duration were held in Ottawa, Chippewa and Washtenaw counties. Each day's program consisted of a time for play, a time for rest and a time for the study of home-making. The camp in Ottawa County, conducted by Mrs. Ruth Morley, County Home Demonstration Agent, had the advantage of an especially fine location at Spring Lake.

Miss Edna V. Smith, Household Management Specialist, reports that a great deal of interest was shown through the state by the visits of The Farm and Home Convenience Truck, a kitchen and bathroom on wheels. Four thousand people attended these meetings and were able to actually see and hear explained a well planned and furnished kitchen and a possible water system for the kitchen and bathroom in a farm home.

A FARM Woman's Institute was held at the College in July. Among the topics for discussion were: Home Improvement; Citizenship, including Child training and social development of the child; and Health Day.

In June the honorary degree of Master of Home Economics was conferred upon two Michigan women, well known in the Home Economics field; Dean Lenna Cooper, formerly of Battle Creek College, and Professor Lydia Roberts, now of the University of Chicago.

An interesting nutrition class was organized at Michigan State Normal

(Continued on Page 46)

The Story of Food and Food Products

Supplementary Reading for Food Study Classes in Schools

The Story of the Banana Industry

By PHILIP K. REYNOLDS
United Fruit Company, Boston, Massachusetts

THE history of the banana is fascinating. It is a story that brings together the adventures of missionaries and explorers and the researches into the records of dim centuries of botanists, archaeologists and geographers. The history of the banana industry to an unusual degree is replete with examples of rugged pioneering and the display of indomitable will in the face of hardship.

As late as the middle of the Nineteenth Century travelers and naturalists wrote of the banana as a delicious fruit for the peoples of the tropics. It was not, however, until the development of modern ocean transportation within comparatively recent years that this luscious fruit became a staple food for the inhabitants of the temperate zone.

"PACKING" BANANAS

BANANA PLANTATION IN PRODUCTION

The banana is grown in most moist tropical countries. The Atlantic Coast of Central America offers ideal conditions for its culture. Here the tropical jungle, extending a few miles back from the Caribbean Sea, has given way to the greatest banana farms in the world.

These lowlands were invaded about 1000 B.C. by the Maya Indians, who established a remarkable empire lasting through many centuries. Some of their monuments built during the first six centuries of the Christian Era are found today in Guatemala, Honduras and Mexico. The Mayas achieved a high state of civilization only to be beaten down and swept away by the forces of disease. As a result the land returned to its wild state during the lapse of many centuries. The banana industry, created by American enterprise and capital, has applied sanitation and preventive medicine in the rehabilitation of these lowlands once the seat of an ancient empire. Central America may well thank the banana trade for the most progressive influence and constructive development which have ever reached its shores.

The demands of the banana have caused the building of wharves and railroads, the sanitation of vast areas of tropical jungle, the advancement of medical science in dealing with tropical disease and the intimate use of commercial radio telegraphy.

Bananas are the product of a rapidly growing plant which, at maturity, reaches a height of from twenty to thirty feet and has a diameter of eighteen to twenty-four inches. The stem, which bears the fruit, pushes its way through the closely grouped leaves nine or ten months after planting and, bending over and down, looks something like a large ear of corn enveloped in its husk. The outer covering drops off, revealing the young bananas pointing downward. Later these embryo bananas turn upward and increase rapidly in size. The bud at the end of the stem is sterile, as centuries of cultivation have caused the seeds of the banana to become atrophied, and planting is done by sticking into the soil rhizomes, or "bits" cut from a healthy, well-developed plant.

Each plant bears but one bunch of bananas, made up of "hands" containing from fourteen to twenty "fingers" or individual bananas. Bananas are commercially classed as ranging from nine to six hands. A nine-hand bunch will weigh between fifty and seventy-five pounds.

Bananas are always cut green, even when they are to be consumed locally. If allowed to ripen on the plant the fruit becomes insipid, the skin bursts and insects, drawn by the sugar within, attack the fruit.

A banana plantation produces marketable fruit from twelve to fourteen months after having been planted. From the day the underbrush is cleared away from the alluvial plain where the plantation is started up to the day the fruit is sold to the local retailer, it is a race against time. And it is because of this characteristic of the banana that a constant express steamship service has to be maintained between the countries where bananas grow and the ports of the United States and Europe.

In order to get the fruit from the plantations to the seaboard, railroads have to be maintained at a high degree of efficiency and rights of way must be kept open despite tropic

(Continued on Page 46)

Nutrition Outline for Third Grade

By MARGARET C, LAMBERT
Marshall College, Huntington, West Virginia

EDITORS NOTE:—The following article is contributed by a student of Marshall College West Virginia, where, under the able direction of Miss Isabella C. Wilson, successful health and nutrition programs are being worked out. In the November issue of THE HOME ECONOMIST we told of Miss Wilson's work and of the excellent Health Books made by the students.

NUTRITION involves, besides correct diet: 1. The formation and practice of habits essential to health. 2. The acquisition of knowledge necessary to health. 3. The development of right attitudes and ideals with regard to health, both physical and mental.

Outline for Lessons

1. Milk a. Milk and its products (butter, cream and cheese).
   b. Why growing child should consume milk.
   c. Milk, the perfect food, for children and adults.
   d. Drill on idea that fruits and vegetables are necessary to child's diet but must be supplemented with plenty of milk, to get all food elements.

2. Milk (continued).
   A. Story, "The Milk Fairies," Dansdill.

3. Milk (continued).
   a. Why we should drink it slowly.
      1. Tastes better.
      2. Easier digested.
   b. Why best food.
      1. Tastes good.
      2. Easily digested.
      3. Very nourishing.
      4. Contains lime (teeth-bone).
      5. Makes muscle and blood.
      6. Inexpensive as compared to other foods of equal nutritive value.
      7. Everyone should have not less than two cups a day. It may be taken in soups, creamed vegetables, etc.

4. Milk (continued).
   a. Excursion to nearby dairy or milk depot.
      1. Note cleanliness of employees, building, utensils, cows, etc.
      2. What relation has the dairy or milk depot to health.

5. Vegetables.
   a. "Vegetables are good to eat.
      This truth I will repeat,
      Eat some cooked, eat some raw,
      To be healthy, obey this law."
   b. Why we should eat vegetables.
   c. When to eat.
      1. At least once a day (green).
   d. Vegetables we should eat.
      1. Potatoes.
      2. Green vegetables — spinach, peas, string beans, carrots, etc.
   e. Vegetables may be served.
      1. Raw.
      2. Cooked.
   f. Care.
      1. All vegetables should be washed or scrubbed before cooking or eating.
   g. Ways of cooking.
      1. Steamed, baked, boiled, or stewed.
   h. Leafy vegetables.
      1. Especailly good teeth-bone.

6. The Garden.
   a. Why we should have a garden?
      1. To get fresh vegetables.
      2. Name some garden vegetables.
      3. What must be kept out of the garden (weeds).
      4. Are bad health habits like weeds? Why?

7. The Story, "The Potato Choosing Boy," Dansdell. (Read and Discuss.)

8. Fruit.
   a. Why is fruit a good food?
      1. Sugar.
      2. Water.
      3. Pleasant taste.
      4. Helps bowel movement.
   b. What should fruit take the place of?
      1. Candy.
      2. May be used as a dessert.
   c. What fruits are good for third grade girls and boys?
      1. Fresh orange, apple, peach, pear, plum.
      2. Cooked baked apple, stewed prunes.
   d. Cut (free handed) as many differenent fruits as you know and mount on colored paper.

9. Water.
   a. Why do we have drinking fountains in our school?
      1. More healthy than cups and bucket.
   b. If using cups—what kind?
      1. Individual (discuss).
   c. Why we should drink water.
      1. Washes out inside of body.
      2. Aids food to digest.
   d. When we should drink water.
      1. Before breakfast.
      2. Before or after meals.
      3. When we are thirsty.
   e. How much.
      1. Child, 2 quarts liquid, most water.
   f. Kind of water.
      1. Pure always.
      2. May be boiled (20 to 30 min.)
      3. Never iced.

10. Coffee and Tea.
   a. Why we should not drink coffee and tea.
      1. Prevents growth.
      2. Contains drugs (habit grows).
   b. A glass of warm milk will.
      1. Warm you.
      2. Rest you.
      3. Give you strength.
      4. Help you grow.
      5. Gain in weight.
      6. Clean skin.
   c. Coffee and Tea will:
      1. Give no strength.
      2. Keep weight down.
      3. Tire you.
      4. Brown, muddy skin.
      5. Cross and fidgety.
      6. Keep you awake and nervous.
      7. Takes away your appetite.

11. Cereals.
   a. Why we should eat cereals:
      1. Make us grow.
      2. Give heat to our bodies.
   b. Kinds of cereals.
      1. Cooked, dark.
      2. Raw.
   c. Make a cereal health poster.
   d. Game, "Vegetable, Fruit, Cereal," Dansdill.

12. Good food habits (copy and establish).
   1. Be cheerful and happy while eating.
   2. Be neat and clean at mealtime.
   3. Eat slowly.
   4. Drink slowly.
   5. Chew food thoroughly.
   6. Eat meals at regular hours.
   7. Play quietly or rest after each meal.
   8. Learn to like your food.
   9. Drink one quart of milk a day.
   10. Eat fruit every day.
   11. Eat at least one green vegetable every day.
   12. Eat candy and cake after meals only.
   13. Never drink tea, coffee, cold drinks.
   14. Divide with others.

Chapters from the Lives of Leaders

What Are the Opportunities in Research in Home Economics?

By LOUISE STANLEY
Chief of Bureau of Home Economics, U. S. Department of Agriculture

MANY are the letters of inquiry that come to us asking, "What are the opportunities for a research position?" Some from those who have a real desire for investigational work, some from those who are tired of teaching and "want to try something new," and many from those who would, for various reasons, "like to spend a winter in Washington."

It does not seem amiss as a result of this, to set up the opportunities in research available here and elsewhere, the qualifications desirable for such women, and the training needed to supplement individual qualifications, especially when some seem to be of the opinion that any woman who can sew or cook, or has managed a home with a fair degree of success should be able to qualify for research in home economics.

The term "research" is not new. Only recently, however, have we come to think in terms of home economics research. So it might be wise in the beginning to start with a definition proposed by a committee of the Land Grant College Association, "Research in home economics should include study by the experimental method of the phenomena and factors which are involved in home life and the problems growing out of homes and their relationships under conditions which permit of a cause and effect relationship." This sounds somewhat involved. Perhaps it is one of those definitions which needs in itself to be defined. Anyhow it furnishes a starting point.

THERE has been some confusion of thought as to where home economics research begins and where research by some of the contributing fields leaves off. After all, why does this matter? The line of division will probably be determined as it is in certain closely related industrial fields, by the market demand, or in this case by relative degrees of initiative. It has even been proposed that there is no such thing as home economics research and that since our problems must be solved by the fundamental sciences they should be, so to speak, farmed out to them. The important point, after all, is that the problems should be seen and conscientious efforts made toward their solution. Any classification of research should be on the basis of the problem solved and not the training of the person doing the work.

Home economics is not a single subject, but a field of knowledge. It draws upon the basic sciences and organizes them around the solutions of home problems. The field subdivides itself into definitely separated aspects of homemaking as food, clothing, housing, child training, and adjustment of relationships within the home, and the economic or managerial aspect which may be developed separately or as a part of the other groupings. Certain basic sciences contribute more to one field than another, but there is considerable overlapping. Most of the problems do not deal with just one of these sciences but may cross-section two or more.

EXAMPLES of this are the studies in the field of child development. The nutritionist might make a study of child nutrition from her own special point of view. If worked out on a practical basis, however, she soon needs help. The psychologist can contribute to a study of development of food habits, the pediatritian determine any diseased condition resulting, the physical trainer show the relation of posture to malnutrition. All have valuable contributions to make. Each may study the child from his specialized point of view and make his own contribution or, by consultation with each other and simultaneous studies of related problems a rounded picture of the whole child can be obtained rather than highly specialized dissected portions.

This is the important contribution of home economics. Growing up rather rapidly during the last few years, much help has been needed. The specialized scientists have come to our aid and by working to a common end rather than within the artificial limitations of a special science, home economics problems have served to coordinate the efforts of the other scientists and organize their knowledge from a new point of view.

There has been a decided increase in the amount of home economics research being done during the last five years. Part of this at least has been stimulated by the establishment of the Bureau of Home Economics in the Department and in part by the passage of the Purnell Act giving increased aid to the experiment stations, a portion of which may be used for home economics research.

MOST new movements receive a stimulus by a governmental act that is far in excess of the actual amount of money appropriated. The creation of the Bureau of Home Economics in the Department of Agriculture is no exception to this. In the announcement of the establishment of the new bureau attention was called to the need for research in this field. In news releases setting forth the plan for the bureau the need was set up definitely in the form of specific problems to be studied. It is hoped that the contributions of the bureau since its establishment have justified the confidence of those interested in its establishment and have served to show the potentialities of such studies.

In agriculture for many years instructional work and research studies have been under way, both federally aided by the Land Grant Act and the acts furnishing aid to the State Experiment Stations. Extension work was started in 1914 as a means of getting results of research study to the farmers.

Home economics started wrong end to. Instructional work has been allowed like Topsy just to grow without the desirable support of a research program. In developing extension it was recognized that a stable agriculture must be based on stable home conditions, and home economics and agricultural extension were started simultaneously. There was so much of value in the "rule of thumb" methods of home economics, that we were slow to see how much more valuable they could be made by scientific study. But the need for this came to be increasingly recognized.

BY the passage of the Purnell Act in 1925, money was appropriated to the states which may be used for home economics research. The total amount to each state under this measure was $20,000 for the first year. This is to increase by $10,000 each year until a total of $60,000 will be available

to each state for the fiscal year ending June 30, 1930, and for each fiscal year thereafter.

Home economics is not mentioned by name in this act. The author wrote one of his colleagues that if home economics was written into the bill "they would want half the money." To the home economics representative he said: "Why mention home economics? If that were done it would be necessary to mention all the other departments in agriculture by name, as dairy husbandry, poultry husbandry, farm crops, and so on." It was provided, however, that some of this money might be used for study of "problems of the farm home," and in the brief supporting the passage of this act home economics is mentioned several times.

THE experiment station directors have been liberal in their interpretation of this act, and some of them have taken seriously their responsibility to home economics. Figures on the use of this money, taken from a recent report made by Sybil L. Smith of the Office of Experiment Stations, show that a total of $210,941, or 13.52% of the total amount available will be spent this year on home economics studies. Most of these studies are being conducted by members of the home economics staffs.

Several foundations have interested themselves in studies relating to the social aspects of home life—home relationships, child training, recreation problems. These have been most helpful in developing a field not yet clearly defined and one whose importance is not sufficiently recognized to obtain government funds for its support. It is believed that these studies will show the problems and their relation to public welfare so as to justify on economic and social grounds additional funds from these sources and eventually government aid.

THERE are an increasing number of commercial laboratories studying home economics problems. Some are organized to study methods and equipment to increase the efficiency of both, and others to obtain the essential facts for sales programs, either selling points or economic studies to determine probable markets. While these laboratories are not new, the introduction of the home economics worker into them is. Her value is now realized and increased extension of this type of work may be expected in accordance with the efficiency of her work. It is especially desirable that more women go into technical studies dealing with the sales end.

The demand for research workers is still variable as would be expected in a field so new. The indications are that it will increase. Probably the most stable demand at present comes from the land-grant colleges and the state experiment stations.

SALARIES vary. For college graduates they start with $1500—$1860, depending upon experience. Few governmental and probably no state experiment station positions pay over $5,000 unless administrative duties are included. The lower grade positions must be looked upon as supplying training on the job, and in laboratories with well-trained directors if the work is organized to allow all to participate it will in many cases, be as valuable as a year of graduate study—in some cases even more worth while. Commercial positions in home economics as in other lines usually pay better. There is less stability in these and certain restrictions. Most of the foundations promoting research give funds in the form of special fellowship grants.

In the educational institutions workers may spend all or part time in research. The instructor who devotes part of her time to research and the remainder to teaching is usually more progressive than one who has no interest in research and certainly carries to her teaching a different point of view. The assistant may be a graduate student doing research as a part of her training.

IN THE state experiment stations the present tendency is toward the employment of full-time workers. This is necessary where the experiment station is not associated with the rest of the home economics division. Home economics as a whole suffers from this, and it is believed that the part-time worker can have the time devoted to research sufficiently safeguarded to make such an arrangement satisfactory to all concerned. Where the research worker offers graduate courses it is usually possible to have the services of graduate students working on certain problems. This contributes considerable work and furnishes, as well, the most desirable type of training for future research workers.

Industrial firms have in many cases preferred to make their contributions towards research directly to such institutions in the form of fellowship grants, believing that in this way they get a higher type of service, are more sure of a disinterested study, and are contributing more to the development of the field as a whole than when the work is isolated in their own laboratories. Unquestionably the usefulness of a good research person is increased many times by placing at her disposal either paid research assistants or graduate students who serve in that capacity during training. The chief difficulty with this type of aid has been that the amounts paid were too small and the period of time was too limited for a person to stay on the job as long as desirable. There is need for endowed or industrial fellowships which will allow some of our trained research workers to keep with them for a longer period of time promising younger workers.

What are the qualifications that are desirable in a person who is headed toward a three-story research job? She should have an analytical, unprejudiced mind, intellectual honesty, keep power of observation, accuracy in small details, good judgment, and a logical mind which can form hypotheses and interpret results.

IN TRAINING and experience, she should have a knowledge of home economics and close practical contact with that particular part of home economics in which she expects to work. This should be reinforced by good sound fundamental training in the science or sciences contributing to the solution of the problems on which she is working. In some cases she may have to go to the specialists in this field for help. Then her knowledge must be sufficient to enable her to work with them understandingly. In addition, she must know how to use research tools, especially laboratory equipment, and materials, and the statistical methods necessary in enterpreting her data.

She must know the literature of her subject and where to get needed information. This means knowledge of how to use bibliographies, how to keep reading notes, and how to organize and relate facts gathered from reading and observation.

In setting up any research laboratory there is a demand for different grades of jobs. Certain of the lower and sub-professional grades do not demand such a high degree of training, and if a person is content to stay in a one-story position fewer qualifications are necessary. The important demands in the lower grade jobs are ability to follow definite directions in doing routine work, and accuracy in doing this and in recording detailed results. Previous training in the processes involved is sometimes required. In some cases opportunities arise where judgment must be used, but the younger worker must be careful not to substitute her own judgment for that of the person in charge without calling attention to this.

The first and second grade jobs are, as pointed out above, valuable as preliminary training, especially when the worker is allowed some initiative and is required to do the necessary reading, set up the hypothesis, and plan the experiment under the direction of some one in authority.

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Home Economics Research at Boston University

Students Conduct a Survey for the Massachusetts Laundryowners' Association

By ELIZABETH McDONALD
Director, Bureau Consumer Research, Boston University

ORGANIZED in the conviction that homemaking is concerned with the production of intangible values rather than tangible commodities in our present economic system, the home economics department, in the College of Practical Arts and Letters, at Boston University does not have the conventional curriculum. The most important feature of our work so far is the establishment of a Bureau of Consumer Research.

The Bureau has for its primary objective the development of an intelligent consumer consciousness on the part of the student. As a secondary objective, implied within the first, it seeks to develop a better understanding among the three factors of the trade triangle, the producer, the merchandiser, and the customer.

The work is developed through a series of research problems, set for our solution by trade organizations. The work is not imaginary but real, the problems not hypothetical, but practical and existent.

An example, briefly summarized, will make the idea clearer.

One of our problems for 1926-27 was given to us by the Massachusetts Laundryowners' Association, which financed the overhead involved by the investigation. The question set was to collect information contributing to the better understanding of consumer-reaction to laundry service.

As the most efficient method of gathering this data we chose that battle-scarred, but still most reliable old campaigner, the questionnaire. Eight hundred students participated in the collection of information. Out of the total we sampled out, according to statistical practice, seven hundred questionnaires for detailed tabulation and analysis.

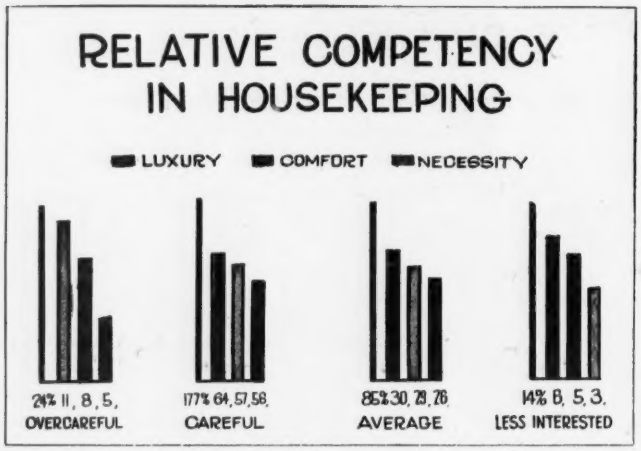
The whole project was managed by the students on our own college equipment from the mimeographing of the forms themselves to the adding machine totals of the results.

As an indication of how widely representative the sampling proved to be the income range is typical. The highest income reported was $100,000 a year, the lowest $1,000. Twelve states beside Massachusetts were represented in the territory covered by the survey. One hundred and ninety-eight different occupations were reported among the heads of the seven hundred families.

Some of our findings have considerable significance. The average family consisted of 4.68 persons. The biological theory that there is a preponderance of male births subsequent to a war was sustained by an average of .25 male children under ten years of age, as against .19 female children in the same age group. In the age range ten to twenty the figures were .47 male as compared with .90 female.

The size of the family decreased in parallel movement to income decrease. In the group having an average income of $13,475.00, the average family numbered 5.31. The next group, reporting incomes averaging $4,606.38, had a numerical average of 4.67. The group reporting an income averaging $2,115.70, has a numerncal composition of only .05 persons. Here is an eloquent piece of evidence that reason gains ascendancy in the solution of home problems.

At the annual convention of the Association sustaining the project, the summarized findings were presented by a group of the students participating in the research. The activity gave them a new insight into the merchandiser's problems and the producer's dilemmas. They discovered



that a huge percentage of laundry patrons want their linen collected on Monday and delivered on Thursday. Two days the laundryowner must carry the charges of an idle plant because of the lack of consumer-understanding. In the matter of collection, not some, but all patrons wanted it done between ten o'clock and half-past ten in the morning. Obviously here is an economic absurdity.

Though the results bristled with stimulating data, enough has been given here to demonstrate our standpoint and our procedure.

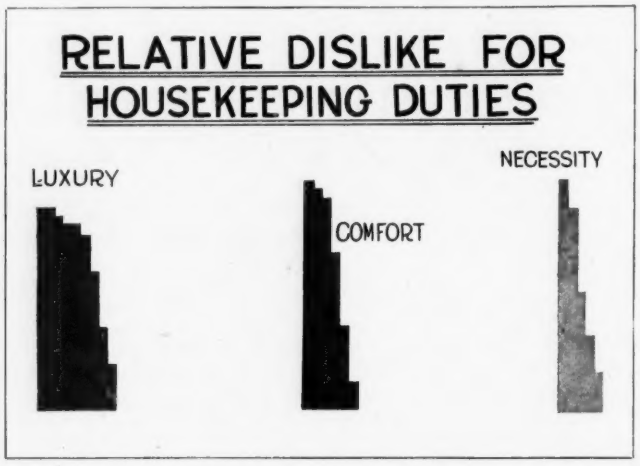
In a mass-production economy, home economics must concentrate on training in delegation rather than individual performance of the impersonal household routines. In order to harmonize home practice with economic circumstances in this new era we have the double responsibility of the study of conditions among producers and merchandisers while we give future consumers a better conception of their own privileges and responsibilites.

For a practical exercise in bringing all these objectives into play in a curriculum no better industry for study than the laundry can be chosen.

Laundering, for example, is seen not as a process carried on by individual housekeepers in individual homes. Measured by the group standpoint, the total time, energy, and investment of capital involved in individual performance entails an appalling social waste as compared with the ideal of a neighborhood laundry operating under the scrupulous perfection of standard practice.

The foot pounds of expended community energy are reduced to a minimum by centralized effort. Investment-capital tied up by individually owned equipment is released for more productive forms of use. For each patron also, released time is won from the less essential activities of housekeeping and given over to the far more significant and delicate task of homemaking.

Before long it will quite likely be true that, except as reminiscent playwork, most housekeepers cannot afford to make things. Their skill will not be demonstrated in fabrication but in selection. Their training should therefore look toward the basic economies of choosing sources of supply and discriminating among combinations of centrally manufactured and merchandised commodities.



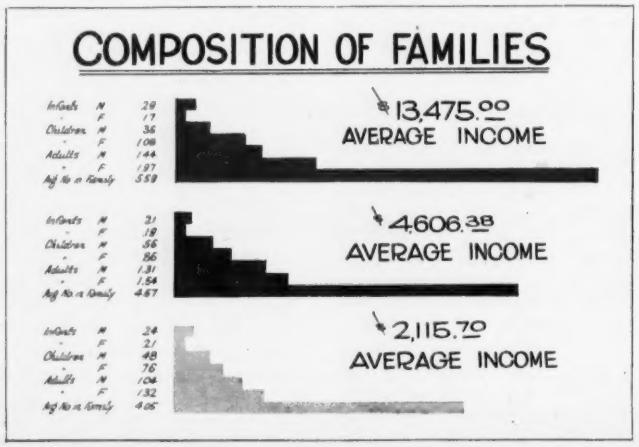
Progress in this direction rests upon our newer conception of homemaking both as a civic responsibility and a social adventure. Not a little of the self-centered irresponsibility of a younger generation is chargeable to an older thought that, with more or less ascerbity clung to the concept of a home limited to God's blessings on

Me and my wife

My son John and his wife

Us four and no more.

The moment we graduate from that plane into one of larger fellowship, home economics rapidly divests itself of the hand-made swaddling clothes of its infancy to put on the more mature garments of a truly social science.



The Story of Textiles

Supplementary Reading for Classes in Clothing and Textiles

The Use of the Micrometer Caliper

By J. A. HILL

Laramie, Wyoming

THOSE who handle woolen fabrics in any way should by some means become expert judges of the fineness of the wool fiber; otherwise they are handicapped in not being able to judge the intrinsic value of the raw material from which the fabrics are constructed. A student could be a specialist in design, know pleasing color combinations, and could even discriminate between the various degrees of softness or "feel" in finished cloth, and yet fall far short of being an expert judge of fabric values if unable to pass judgment upon the fineness of the wool fibers from which the fabrics are constructed.

Type of micrometer caliper used in measuring wool fibers

Those who understand woolen fabrics know that the cost of the raw material increases with the increase of fineness of the wool they contain. The fabrics constructed of fine fibers have greater strength for a given weight and have, on the whole, a more satisfactory durability than those fabrics constructed of coarse fibers. Softness is itself an important property that depends on fineness. A piece of goods may be made of coarse fibers and finished so that it appears soft when new; yet the artifice of the finisher is soon lost and the fabric becomes harsh after it has been worn awhile unless it is made of wool that is soft and fine.

The richness and depth of color that sets fabrics made of wool apart from the materials that are made from other textile fibers can only be obtained to its fullest degree from the finer wools. Serges and similar stuffs manufactured from worsted yarn take on an undesirable shine more quickly if made of coarse fibers than if made of fine. Moreover, in order to study a fabric intelligently, it is necessary to know whether the fibers in it are of uniform fineness or whether it is made up of a conglomeration of coarse and fine fibers. As a general rule, the more uniform the fineness of wool fibers that enter into a piece of goods, the more pleasing to the eye it will be.

TESTS and observations have convinced me that untrained people have very little discrimination when it comes to judging the fineness of wool. They may be intelligent, their senses may be keen from a physiological standpoint, yet without training they are unable to judge fineness except in very wide degrees. I have often had highly intelligent visitors to my laboratory select the very coarsest specimen of wool on display, thinking it was the finest, the average diameter of the coarse sample in some cases being two and one-half times that of the fine.

In the wool laboratory of the University of Wyoming we have, during the past ten years, developed a technique for the use of the micrometer caliper for measuring the diameter of wool fibers. We are thoroughly convinced of the practical usefulness of this instrument in experiments where it is necessary to measure the fineness of wool quickly and correctly. As a by-product, so to speak, of our experimental work we have found that the caliper has a useful place in the laboratory for the instruction of students. We had not worked with the caliper long until we found that its systematic use in measuring fibers soon trained the person doing the work so that he attained an unusually good judgment of fineness. I first discovered this several years ago when I found that a student assistant who had been measuring a large number of fibers on the caliper was able to estimate the diameter of fibers within an error of plus or minus one ten-thousandth of an inch about nine times out of ten. At first this seemed like an uncanny power, but years of work with students since then has shown that this degree of skill can be developed in almost anyone who has patience enough to measure wool systematically. We have now worked out a definite procedure for teaching this discrimination of wool, in the case of students of wool production, which becomes the foundation for their practical work in grading. Since we have adopted this practice, our students learned wool grading and sorting very much more rapidly than they were able to by the method previously used of having them sort out samples of wool of various fineness, followed by a correction of their sortings by an instructor.

I REMEMBER my experience in learning to sort and grade wool. The instructor showed me a sample of wool and said, "This is a half blood" and then showed me another and said, "This is a three-eighths blood," and so on. Then he gave me unsorted wool and asked me to match these samples or to divide the unsorted wool into piles corresponding to the three or four samples shown. I learned very slowly by this process because my eye had not been trained to discriminate between the individual fibers of whch the samples were composed. Everything seemed more or less hazy to me. The instructor pointed out differences that I could not see and had no means of measuring. It was not until after I had done considerable work in testing fibers for strength, and handled wool fiber by fiber, that I acquired sureness of judgment in comparing samples of wool for fineness. But even after years of fairly successful experience in practical grading, I found my judgment very much improved when I began to measure wool with the micrometer caliper. The students who begin to sort and grade wool after preliminary lessons on the caliper, start out with a feeling of assurance that was unthought of before we used the caliper. In fact, if the instructor tells the student that Sample A is finer than Sample B, and the student doubts it or believes that Sample B is finer than Sample A, he can back his judgment by measurement on the calipers. It has not been unknown in our laboratory for the instructor to be proved wrong by a student who has worked faithfully with the calipers.

PRACTICAL judges of the fineness of wool seem to depend considerably upon the fineness of crimp. For a general rule, the finer the natural crimp or curl in the wool fibers found in the fleece, the finer the fiber. Many

who judge sheep in the show ring depend almost entirely upon crimp as an indicator of fineness in wool. In fact, our standard works on animal husbandry give this as the approved method of comparing the fineness of wool. While it is true that there is a fairly high degree of correlation between fineness of crimp and fineness of fiber, it does not hold universally. Very often the judge who depends upon crimp alone in determining the fineness will be one or two whole grades in error. Even if dependence on crimp serves the student of animal husbandry and the growers who handle the unscoured wool in the mills, it is of no value for the textile student because as soon as wool is scoured, the crimp is so distorted that it loses the value that it had in the original fleece for measuring fineness. Moreover, in the manufacture of worsted yarn, one of the aims of the whole process is to remove completely and permanently all the crimp that was originally in the fiber. Therefore, the textile student who undertakes to analyze the yarns of woven or knit goods must learn to work without the help of crimp.

However, the student of textiles does not need to despair of being able to attain a good working judgment with respect to the fineness of wool, even if only a short time can be devoted to attaining it. I am convinced that it is just as easy to discriminate fineness of wool as fineness of nails or even trees in a forest. It all depends on being trained to look at the fibers individually and to have some standard of measuremnet or a basis for comparison. The work of the psychologists in sense discrimination has shown that the ability to be sure of a difference in the size or weight of two objects is determined not by the total differences between two objects but by the proportion of difference. It is no more difficult to discriminate between weights of one ounce and one-quarter ounce respectively than it is between weights of one pound and one-quarter of a pound. So if we have normal vision and learn to observe wool fibers, it is probably no more difficult to discriminate between a wool fiber that is five ten thousandths of an inch and one that is seven ten-thousandths of an inch in diameter than it is between two fence posts, one of which is five inches in diameter and the other seven inches.

IT IS true that the micrometer caliper is not the only means of measuring the fineness of wool. The microscope with a micrometer stage had been in use many years before the caliper was thought of, and it is still being used throughout the world today. A variation of the method using the micrometer stage is to project the image of the wool fiber through the microscope upon a screen. This makes possible the use of larger measuring instruments than the micrometer stage. Recent work in England has developed a method that promises to be of considerable value in determining average fineness. A number of fibers are weighed and the ratio between weight and the total length of the fibers is used as a measure of fineness.

NO matter what the relative value of the various methods of measuring may have for research purposes, I am strongly of the opinion that the micrometer is the best instrument we have so far for teaching discrimination of fineness to studens. The following are some of the reasons why I believe that this is true:

1. The micrometer is an instrument that the ordinary student can learn to manipulate without much difficulty. It is of substantial construction and is not expensive. About thirty dollars will buy the best that is made, and cheaper ones that are satisfactory for personal use can be bought for about half this amount.

2. The wool is much more easily prepared for measurement with the caliper than with the microscope. The standard method of microscopic preparation consists of mounting the wool on a cover glass, usually in balsam, but sometimes in glycerine. If the balsam method is used, a day or two generally elapses between the preparation of a sample and the time when it is actually measured. With the caliper, a student can be given a sample of wool and he can clean this in a little benzol, dry it between blotting paper or felting paper, and proceed at once with the measurement. It has been found that the work of measurement, once it is begun, goes as rapidly with the caliper as with the microscope. A student of moderate speed and deftness can measure one hundred fibers with the caliper in twenty to thirty minutes.

3. The most important advantage of the caliper is the fact that fiber being measured is, under the observation of the senses in a normal way at the time it is being measured. With the microscope the fibers that may have been placed under the slide an hour, or even a day or two previously, are beyond the sense of touch of the operator because they are under a cover glass. Under the ordinary procedure for microscopic measurement, a number of fibers are under one cover glass. The fibers are not in a position in which they can be seen normally by the eye, but are under observation as images very much enlarged, so that there is no chance to make an association between the organs of sight and touch and the actual measurement of a given fiber, or the comparative size of two fibers. Contrasting this with the measurement of a fiber by means of the caliper, a single fiber is taken in the fingers so that there is a definite impression upon the sense of touch. In order to get the fiber into position for measuring with the caliper, it must be under close observation of the eye. In fact, we arrange for the correct lighting of the instrument and provide a dark background in order that the best possible view of the fiber can be obtained. So when the student draws out a fiber and measures it, he can say to himself: "This is the way a fiber looks and feels that measures this number of ten-thousandths of an inch."

IN ORDER to keep the student alert, we require, as soon as a little preliminary practice has been obtained, an estimate of the size of each fiber to be recorded before it is measured. The student is, therefore, stimulated by the record of proress that is being made.

The instruments we find most satisfactory are direct reading machinists' calipers, graduated to ten-thousandths of an inch. The vernier calipers cost considerably less but are not easy to read, not because of the difficulty of reading the vernier, but because of the manipulation necessary to bring the vernier into position to be read.

OUR method of recording measurements is by means of a frequency distribution, samples of which are shown herewith. The kind I originally used and found satisfactory is shown in Table I, which is simply a tally sheet method. However, Professor Burns, of the University Wool Laboratory, devised the method of recording shown in Table II, in which the count is kept by means of recording the estimated diameter on the line for the measured diameter. Thus, if a student estimates that a fiber measures five, and it actually measures six, he enters the number 5 in the 6 line. The average diameter and other statistical constants can be determined from the frequency table; also the error of judgment can be calculated.

The method outlined can be adopted almost completely by the instructor in textiles. A series of fibers can be analyzed, running through the range of fiber diameter usually found in domestic fabrics. At the beginning, at least, the fabrics should be plain serges or similar loosely woven worsted fabrics in order to make it easy to pick them apart and separate the wool fibers. Since all the yarn would be of one, or at most two kinds, the task of measuring the fibers in a large number of yarns would be simplified. For example, suppose we take a sample of blue serge for light-weight suiting. A

strand of the warp yarn would be picked out, and also a strand of the filling. These would be untwisted, opened up, cleaned in benzene, dried and placed in marked containers. One hundred fibers of the warp taken out in regular order would be measured and recorded, and also one hundred fibers of the filling, or at least enough of the filling to make certain that it is no different than the warp in fibers. The record wou'd then show a frequency distribution from which could be determined the average fineness of the fibers and the uniformity as measured by the range from finest to coarsest. If necessary, the grade of wool could be determined by comparison with the measurements of standard samples of wool grades.

Table I.—Showing method of recording measurements with micrometer caliper.

Diameter in ten-thousandths of an inch	Frequency	Total Frequency
5	5 2	6
6	5 5 5 5 5 1	26
7	5 5 5 5 5 5 5 5 4	44
8	5 5 5 5 2	22
9	2	2
	Grand total	100

Tible II.—Professor Burns's method of recording both actual size and estimated size

Actual size in ten-thousandths on an inch	Estimated size and frequency distribution of actual size					Total Frequency
10	10-12-12- 11-13-13-	12-13-11-	11-11-10-	12-11-12-		3
11	14-10 12-11-12-	13-13 12-11-14-	12-14 13-14-13-	12-12	12-13	22
12	14-13 11-14-13-	11-12 14-13-13-	12-12 11-14-13-	14-11-14-	13	15
13	13-12 14-15-14-	13-12 14-14-12	13-12 14-12-12-	13-13 14-14-12-		21
14	14-14 13-14-14-	14-15 13-12-11	13-14 15-12-15-	14-14	13-15-14	23
15	14-13	12-15	17-14			15
16	14					1
					Grand Total	100

FOR the ordinary student these exercises should not be so numerous as to become tedious, or to take up an undue portion of time compared with the other requirements of the course. Perhaps not over five periods should be allotted for this work for the general student. Those who for some reason wish to specialize in woolen fabrics or to enter upon a research problem, could have the work profitably extended to include fifteen or twenty exercises. The instructor should not conclude that the exercises are of no value, simply because knowing that a fiber is constructed of wool fibers having an average diameter of five ten-thousandths of an inch or fifteen ten-thousandths of an inch is knowledge that is not going to be needed by the average housewife or teacher of textiles. The thing to keep in mind is that through these measurements we are teaching discrimination and judgment in fineness by the method that has been found to work best.

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Correction

IN the October issue of THE HOME ECONOMIST, Miss Elspeth Bennett's title was printed — "Supervisor of Home Economics, Kentucky". This is an error. Miss Bennett is Director of Nutrition for the Kentucky State Board of Health. Miss Ronella Spickard is the Home Economics Supervisor.

Home Economics Exhibit

By PAULINE SMAWLEY
Elementary Home Economics Teacher, Portland, Oregon

Scene: Living room of a home.
Time: 4:00, last day of school.

Characters:

Mother
Daughter, representing 6th grade.
Classes: 7A, 7B, 8A and 8B.

As curtain opens, mother is seen sitting in rocker, sewing. She may be humming a tune.

Daughter rushes in excitedly, throwing stack of books on table.

D. (happily): Oh, mother, I'm so pleased. I'm sure I passed—so I'll be in the 7A next year!

M. (listlessly and rather sarcastically): Well, I certainly would hope you passed. You aways have, so why get so excited about it?

D. (going over towards mother): Oh, but you see, mother, it means so much more this year. Why next year I've got to take cooking and sewing. Just think how much more I will be able to help you then.

M. Now, dear, of course I don't want to discourage you, but really cooking and sewing in school is just a lot of extra work and expense for nothing. I could teach you those things right here at home when I think you are old enough to be learning them. Why use school time for learning to cook and sew?

D. (convincingly): Mother, you haven't had time to go to the school displays and I believe you would be surprised to know just how much the girls do learn about cooking and sewing—to say nothing of personal hygiene and home making in general.

M. Well, if the girls do accomplish all that—why not invite in some of your friends so that I can see them.

D. Good! I have already asked them and they will be here almost any minute now.

(Knock is heard at back door.)

D. (going to door): This must be one group now. (At door) Hello, girls, we were just waiting for you. (Soft march music as girls enter single file, wearing cooking outfit and carrying sewing bags on right arm; a 12 inch white cardboard with black letter in left hand side. Form semicircle at front of stage. M. and D. at extreme left end.) Now, please, let mother have a good look at you. I see you have your new aprons and headbands on and are carrying your hand made bags. Do tell us something about Home Economics. I see you have some letters. What do they mean? (Girls all put alphabet letters in front of them. Complete black lettered alphabet against white aprons.)

Girls: We'll tell you! (Each girl steps forward as she gives her line):
A is for aprons, we must wear when we cook,
B is for bread, how much kneading it took.
C is for canning we did in September,
D is for dishwashing, done by rules we remember.
E is for eggs, poached, scrambled and plain,
F is for right food, we must have it to gain.
G is for grief when our jelly won't jell
H is for health our appearances tell.
I is for joy when we've done a good deed.
K is for kettles we keep scoured so bright,
L is for luncheons; we will serve them just right.
M is for manners, table manners, I mean,
N is for nails, we keep polished and clean.
O is for onions, we put in the stew
P is for puddings, and we make cakes too.
Q is for questions we ask by the score
R is for rhubarb, such sauce calls for more.
S is for salads, so cold, crisp and green.
T is for toast, the best you have seen.
U is for unafraid of hard work, you'll agree,
V is for vitamins, A, B, C and D.
W is for white sauce, we can make it so snappy,
X is for excellent such a grade makes us happy.
Y is for youth may we never grow old,
Z is for zeal for Home Economics, may it never grow cold.

Daughter: That alphabet certainly is unusual isn't it, mother?

(Knock is heard at bock.)

(7A girls go to back of stage as daughter starts to door.)

D. (going to door): Isn't that pretty fine for just 7A girls? (At door.) Oh, these are the 7B girls. Just see what they have brought with them. (D. brings girls is a soft music plays. They also form semicircle at front of stage. Have clothing folded over arm.) Hold up your pretty night gowns so they can be seen. And oh, such well made bloomers. Some of you have made more than one night gown and one pair of bloomers, haven't you?

(Knock, 7B girls go to back of stage.)

D. Another knock, those must be the 8A girls. They have a nice show for you, too. (Music.) Everyone has a costume slip. (Show.) You also have something else—what is it? Oh, clothes pin aprons—what lovely gifts for mother or perhaps with such nice aprons mother won't have to do the clothes hanging. And you two girls have something pretty. (Show bags for the clothes closet or bedroom doors.) These do keep the room neater and the shoes in better shape. That's what the 8A girls do, mother. (Knock—girls go to back of stage.)

D. (on way to door, confidently to audience and mother): These are the 8B girls coming to show their pretty new dresses. Do notice them. The girls are all very proud and I'll just bet their mothers are rather proud, too. (Girls enter by twos. They carry books if wearing plain dresses, or if fancy, anything appropriate. Tennis rackets with sport dresses. Daughter brings in each couple. One girl waits at side as other girl goes to center, poses, turns, poses again, then passes to back of stage together. Waltz music for dress parade.)

D. Now, mother, do you still feel as you did about Home Economics in the schools?

M. I'm sorry, dear, that I even thought such a thing. These girls have done some fine work. I am only anxious for you to begin and do your very best. Home Economics has as important a place in the schools as any other branch of school work. I congratulate you girls and I want you to know that beginning right now I am a real booster for Home Economics. Three cheers for Home Economics!

(Girls with white aprons hold letters at this time to form Home Economics and step forward. Altogether the girls yell "Three Cheers for Home Economics.")

March music as girls file from platform.

Health Outline for First and Second Grade

By VINA MARIE FRAME
Marshall College, Huntington, West Virginia

Lesson I—SLEEP.

Teacher's Aim: To teach the child the need of sleep; to influence him to get more sleep or enough sleep, which will result in a happier, healthier child.

Child's Aim: To find how much sleep he really needs, and why.

Procedure:

a. What does sleep do for us?
   1. Body rests.
   2. Fairies rebuild and repair.
b. Amount of sleep we need.
   1. Six or eight year old, from 11 to 14 hours daily.
   2. Contrast happy and sullen child.
a. The correct way to sleep.
   1. Windows open.
   2. Alone if possible.
   3. Sleep in night garments.

Lesson 2—EXERCISE.

Teacher's Aim: To teach the child the beneficial qualities of fresh air, and to induce him to get more by playing some time out of doors every day, and having a well ventilated house.

Child's Aim: To learn why he should play outdoors even in cold weather, and keep his windows open at night.

Procedure:

a. Discuss influence fresh air has on health.
   1. Stupid in hot, close atmosphere.
   2. Invigorated in cool, fresh atmosphere.
b. How to obtain fresh air.
   1. Stay out doors part time.
   2. Windows open at night.
c. Discuss exercise—playing.
   1. Why should we play outdoors?
      a. Happy children.
      b. Hungry children.
      c. Preparation for athletics.

Lesson 3 IMPORTANCE OF WATER

Teacher's Aim: To induce the child to drink sufficient water to clean his system.

Child's Aim: To learn that water is not a thing to be feared and avoided but a point on the road to health.

Procedure:

a. Why should we drink water?
   1. Cleans us inside.
   2. Makes us hungry and to feel good.
b. How much water should we drink?
   1. Every one should drink from six to eight glasses of water a day.
   2. Do not drink water with meals —tendency is to wash down food.
c. Drink pure water.
   1. Do not drink from questionable sources—roadside, springs, etc.
   2. Do not drink after another person.

Lesson 4—GOOD POSTURE AND BREATHING.

Teacher's Aim: To secure better health for pupils and better appearance by influencing them to have better posture and to breath correctly.

Child's Aim: To learn why he should stand or sit straight; why he should breathe deeply and correctly.

Procedure:

a. Posture.
   1. Show picture of child standing straight; of child all drooped over: Which looks better
   2. Why is it better for us to stand and sit straight?
   3. Draw stick figures showing straight backs and crooked ones.

(Continued on Page 48)

Health Educatiom in Public Schools

(Continued from Page 28)

ous reel. This reel is made from ordinary brown wrapping paper on which has been pasted pictures cut from magazines, thus illustrating the story desired. Some of the reels have been on "A Good Breakfast," "Sleep and Rest," "Whole Cereals" and the like. Already fifteen movies have been placed in kindergartens throughout the city. Another order is being made by the boys at Vocational High School, so that by the end of the year, we hope to have at least one movie for every school.

Even arithmetic is used to stimulate health interest. One third grade teacher made a poster of two pint "milk bottles" equal one quart "milk bottle." Various other devices have also been used.

A six weeks' health club was carried on in every fifth and sixth grade last spring. This was a most successful campaign and it will be done again this year. The club was carried on entirely by the children and they enjoyed it immensely. This method of health teaching not only aids in formation of health habits, but develops initiative, responsibility, and a sense of parliamentary procedure.

This year a health program is being worked out for Junior High Schools. Health Education will be introduced here through English, Geography and Civics, as well as Home Economics and Physical Training. An outline for the teachers of the first three of these subjects will be ready for distribution by the first of next term. The appeal to the girls will be to have healthy, graceful and even beautiful figures. The boys will be interested in Health Heroes and both major and minor sports. Eventually we hope to enter Senior High School through Biology correlation.

Several nutrition classes have been conducted every year in schools where the percentage of underweight was high. These classes were for children who were 10 per cent or more underweight. Trained Home Economics people have been placed in charge of these classes. Type lessons were worked out in our office and these classes were supervised as closely as possible. The gains made, not only in actual weight, but in mental ability have more than proven the success of these classes.

There are many other phases of health work which we hope to develop and on which we are working, but we have learned by experience that new ideas must be slowly and carefully advanced.

Fundamentals of Electric Refrigeration

(Continued from Page 30)

compressor and its motor to start running and draw off the heat laden gas from the evaporating coils. The drawing-off of the gas in the coils by the compressor reduces the pressure in the coils; this causes the admission valve to open and admit more liquid sulphur dioxide into the coils to take the place of that which has absorbed heat from the refrigerator through the coils or brine tank (where one is used) and been changed into sulphur-dioxide gas.

As the heat laden sulphur dioxide gas is drawn out of the evaporating coils, it is forced through the compressor where it is compressed into a high pressure gas. From the compressor, the high pressure sulphur dioxide gas goes into the coils of the condenser. These coils are exposed to the room temperature air.

It is necessary to change this low pressure gas to a high pressure gas because the temperature of the low pressure gas when it is pumped out of the evaporating coils is lower than that of the surrounding room-air. Therefore, before the heat which it contains can be extracted by the air

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"Advertising Booklets as Reference Material for Home Economics Courses" in the January issue of The Home Economist?

We would like to have your opinions of the helpfulness of this material in your class room work.

Send your comments to The Editor,

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surrounding the condenser coils, its temperature must be raised to a higher degree than that of the surrounding room-air (heat flows from a warmer to a colder body). Thus the second function of the compressor is to raise the temperature of the sulphur dioxide gas removed from the evaporating coils to a temperature point higher than that of the air surrounding the condenser coils.

In the condenser coils, the high pressure sulphur dioxide gas is cooled by fanning a current of air over the coils. This changes the compressed gas back to liquid sulphur dioxide (Kelvin's Law) so that it is ready to be admitted again to the evaporating coils in the cabinet and to do its duty in absorbing heat through the coils.

This cycle (see illustration) continues until there is no longer any excessive heat in the refrigerator, and the correct temperature range has been produced. When this correct temperature is reached the automatic control signals to the motor to stop running the refrigerant ceases to circulate through the system.

Under normal conditions, the refrigerant will be made to circulate through the refrigerator for about one hour out of every five hours. In other words, this means that the motor will run on an average of about five hours in 24 hours. It is the length of time the motor runs that determines the amount of the electric bill; and the length of time that the motor runs depends on the use the owner gives the machine, i. e., putting warm foods into the cabinet; freezing water and desserts in large quantities and opening the doors many times, will make frequent changes in temperature in the refrigerator.

Good housekeeping Institute states that "under our conditions of kitchen use, a refrigerator of seven cubic feet food compartment volume will consume about 1¾ kilowatt hours of electricity per day when the average room temperature is 75 degrees. The cost of operation will vary with the size of the refrigerator and the cost of electric current per kilowatt hour.

By this automatic circulation of the refrigerant through the evaporating coils in the refrigerator, a cooling surface is provided that gives the right size, with the right shape, in the right location, to provide constant and thorough circulation of air at the right speed so that enough heat units will be absorbed to maintain an even temperature at the right degree. This is just exactly what is needed to prevent food spoilage, and is the story of electric refrigeration, in one long sentence.

The advantages to be derived from an electric refrigerator are:

1. Better foods
2. Convenience
3. Economy

Food has two great purposes to serve: (1) health and (2) enjoyment.

Electric refrigeration provides a place in which to store foods so that they will be in perfect condition when consumed.

It also provides by means of the trays which fit into little sleeves in the evaporating coils or storage tank (where one is used) a convenient way to freeze tempting desserts and chill salads and freeze water into ice cubes for table use. Desserts and water are frozen in about five hours.

As a convenience, an electrical refrigerator brings freedom from ice deliveries; permits convenient placing of the refrigerator in the kitchen; reduces to a minimum the trouble of cleaning the refrigerator, and favors convenience in marketing.

Electric refrigeration is economical because its operating expenses are on the average less than the cost of ice; it reduces food waste through lessened spoilage and permits the buying of food in larger quantities because a safe storage space is provided.

But suppose we stop thinking in terms of mere refrigeration and think in terms of what homemakers really want. They want better food, the safeguarding of health and the assurance of appetizing things to eat. And they want these things with as little fuss, mess and drudgery as possible and at the lowest possible cost.

Pamphlets and Booklets Received

"Old and New Ideas of Diet." By Philip B. Hawk, Ph.D. Published by the Best Foods Home Economics Service, 80 E. 11th St., New York.

"Scientific Research Applied to the Canning Industry." Bulletin No. 103A. National Canners' Association, Washington, D. C.

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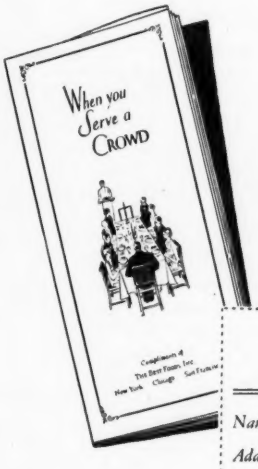

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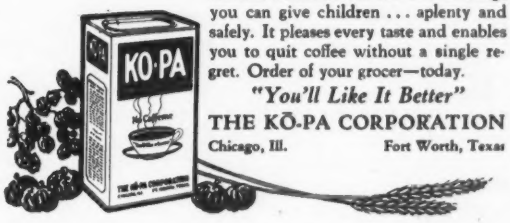

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For Supplementary Reading in Home Economics Classes

USE

OUR FAMILY FOOD and
FOOD and HEALTH

There are newspaper Syndicate Services found in the following newspapers:

Baltimore, Md., Sun
Bellingham, Wash., Herald
Brooklyn, N. Y., Chat
Columbus, Ohio, State Journal
Dallas, Texas, Times-Herald
Everett, Wash., Herald
Long Beach, Calif., Sun
Lorain, Ohio, Journal
Monterey, Calif., Herald
New Bedford, Mass., Standard & Mercury
Oil City, Pa., Blizzard
Portland, Me., Press-Herald
Poughkeepsie, N. Y., Sunday Courier
Portland, Me., Press-Herald
Providence, R. I., Journal
Richmond, Va., News Leader
Roanoke, Va., Times World
Rochester, N. Y., Democrat & Chronicle,
Salt Lake City, Utah, Tribune
San Antonio, Tex., Light
San Francisco, Calif., Chronicle
St. Louis, Mo., Post Despatch
St. Petersburg, Fla., Evening Independent
Tulsa, Okla., World
Washington, D. C., Star
Worcester, Mass., Gazette

If your newspaper does not carry them, a word from you to the Editor will help you have this material available.

Sample releases sent on request

The Home Economist
and The American Food Journal
468 Fourth Avenue New York

Home Economics in Michigan

(Continued from page 32)

College, Ypsilanti, this year, in the open-air room of the training school. All the children were weighed once a week and their height measured once a month. One week they had a lesson in nutrition and the next week were taken to the foods laboratory where they prepared food for luncheon. The children also carried on an eight weeks' experiment in animal feeding. The two children who showed the greatest weight gains for the preceding week were allowed to feed and weigh the rats.

The Michigan Home Economics Association publishes several news letters through the year. The Club Number, April, 1927, was in charge of the Home Economics Club at Battle Creek College and the Child Welfare Number was prepared by Alice Wallin of the Highland Park Nursery School. Two Michigan newsletters were among those exhibited by Miss Edwards at the A. H. E. A. meeting at Asheville, N. C.

THE first nursery school in connection with the home economics department at a state institution in Michigan was opened during the summer term at Michigan State College and regular courses are being given this fall in charge of Miss Catherine Miller. Courses in child study, child nutrition and children's clothing, etc., are being given.

We are quite proud and justly so of the number of "Home Economics Clubs." Twenty affiliated last year and we rank fourth in the A. H. E. Association. Some of the most active are at Albion College, Hillsdale College, Alma, Ann Arbor, Benzonia, Buchanan, Bryson, Detroit (3), Lapeer, Niles, Pawpaw, Richland and many others including those at the state colleges.

Last spring the Journal of Home Economics invited every student club affiliated with the A. H. E. A. to send in a short account of its history and any unusual or suggestive features of its activities. Over fifty reports were received from the 303 clubs then on the list. Honorable mention was given to the club at Wakefield, Michigan. Papers representing normal schools and colleges were published next.

In the Bulletin of the A. H. E. A. for January which was on student clubs, some of the work of the club at Michigan State Normal College was mentioned. During Better Homes Week the girls had charge of exhibits and educational posters in store windows.

MICHIGAN ranks second in gain of members in the A. H. E. A. and is second in gain of members. Twenty-five members were at the annual meetings at Asheville, N. C., June 20-24. Mrs. Merle Byers of Michigan State College, Lansing, spoke at the Meeting of Supervisors held before the annual meeting, June 20th, on Home Economics Curriculum Building.

The Home Economics teachers in our public schools and teachers colleges are well trained for splendid work. One of the latest newcomers to Michigan is Olga Hoesly, M.A., Columbia University, who came to Marquette last fall as head of the home economics department at Northern State Teachers College.

The University of Michigan has added a home economics woman to its staff. Miss Lenna F. Cooper will be head dietitian at the University Hospital. She will continue her connection with Battle Creek College, acting as advisor to the Division of Home Economics.

The strength of our Home Economics education throughout the state is due to such leaders as the president of our state association, Jessie Walton. She told us in her message to us that the strength of our state work depended on that of each Home Economics teacher in her particular situation.

The Story of the Banana Industry

(Continued from Page 33)

storms and attending landslides and washouts. Finally, for communication between ships and shore, that wonderful discovery—radio telegraphy—has been so developed that at all times the condition of plantations and the condition of cargoes may be quickly and accurately known.

Profitable farming in the North consists in grouping acreage so as to keep down overhead. Of necessity this procedure is impossible in banana farming. A plantation may be ready to harvest and moderate wind may lay the fruit flat on the ground. A year's labor is wasted. Excessive rainfall is another cause of loss. But these disturbances of Nature are usually local, and from plantations situated elsewhere it is always possible to secure a supply of fruit for the markets of the North. It follows, therefore, that banana plantations must be widely separated and each plantation, or area, be a self-contained unit.

When bananas have reached a certain stage of development they must be cut, and as promptly shipped. Delays are not dangerous; they are fatal. Speed is the essential, and week after week throughout the year a fleet of ships moves with certainty and dispatch to carry the fruit to Northern markets.

From the time the banana is cut from the tree to the time it is ready to eat many complex transformations, almost human in their action, take place. The banana breathes much the same way as does a human being and in the process of ripening generates heat within itself. When subjected to a few degrees of temperature above or below its normal requirement, too rapid ripening may be stimulated or the fruit may become chilled and its vitality checked. When harvested, the 20-22 per cent carbohydrate content of the pulp is in the form of raw starch; when fully ripe, i. e., when the golden yellow peel is flecked with brown, this starch is practically all converted into easily digestible sugars, the peel rapidly separates from the pulp and the pulp itself is soft and mellow.

The banana is a delicious fruit and one of the most important energy-producing foods. When used with milk, its carbohydrate content makes an ideally balanced ration; when combined with other fresh fruits and the leafy vegetables, it supplies the needed calories.

Its small quantity of protein and fat enables the dietitian, as is often necessary, to increase calorie values without appreciably adding to the protein content.

As a protective food the banana is an excellent source of vitamins A and C and a good source of vitamin B; it also has an appreciable quantity of the essential mineral salts.

It is a nutritious, natural food requiring no, or only the simplest, preparation. It may be served in many ways and its flavor blends agreeably with those of other fruits.

Measured in terms of food value, the banana costs on an average throughout the year less than any of the other fresh fruits and most of the common vegetables.

Tests by eminent dietitians have shown that in a fully ripe condition, or when cooked in the unripe state, the banana is easily digestible and possesses great food value in the dietary of both young and old.

In the treatment of certain diseases —chronic intestinal indigestion in children (celiac disease), scurvy, and inflammation of the kidney (nephritis)—the banana has proved of great value.

With proper care it may be shipped to distant points without deterioration. It reaches the consumer in a germ-proof package.

Since cold prevents proper ripening and the development of the fine natural flavor, bananas should not be kept in the ice-box unless they are fully ripe.

SOURCES OF MATERIAL
for use of
Home Economics Teachers

Below are listed booklets and other helps to home economics teachers. Send your request direct to the manufacturer, being sure to ask for material mentioned in THE HOME ECONOMIST.

Teacher's Outline for a Domestic Science Course

A series of interesting bulletins with lesson plans.

R. B. Davis Baking Powder Co.
38 Jackson Street, Hoboken, N. J.

Domestic Science Bulletins

A series of leaflets, arranged as lesson plans, featuring the use of fruit. Numerous recipes. Valuable for teachers of home economics.

California Fruit Growers Exchange
Educational Dept., Box 530, Sta. C.,
Los Angeles, Calif.

Down East Recipes

Recipes for North Atlantic and Maine Coast fish products. Colored illustrations to suggest the most attractive ways of serving these dishes.

Burnham & Morrill Co.
Box 957 Portland, Me.

"The Art of Making Bread"

Beautifully illustrated booklet, containing chart, picturing and explaining every step in bread-making. Also Wall Chart for Class Use and Outline of a Course in Bread Making.

Northwestern Yeast Co.,
1750 North Ashland Avenue
Chicago, Ill.

Oleomargarine, Its Purity, Wholesomeness and Economic Importance

Valuable information concerning the production, food value and economic value of oleomargarine. Prepared by our research department.

Institute of Margarine Manufacturers
Munsey Building, Washington, D. C.

To the Teacher

A booklet showing how to visualize to classes facts about powdered milk, with educational wall chart.

Merrell Soule Company
N. Franklin St., Syracuse, N. Y.

"Food Value of the Banana"

A 24-page booklet, with cover in five colors, presenting this subject in text and tables, on authority of leading dietitians

United Fruit Company
Research Dept. 1 Federal Street
Boston, Mass.

Milk to Drink

Formulae for tempting milk and fruit juice drinks which appeal particularly to children and help them take all the milk they should have.

Pet Milk Company
Arcade Building St. Louis, Mo.

Nutrition and Health — Child Health

Fifth Edition of "Nutrition and Health." This new, enlarged edition contains all of the former important material, with the addition of valuable scientific information.

"Child Health," handbook for mothers is also available to the teaching profession.

The Borden Company
300 Borden Building 350 Madison Ave.
New York, N. Y.

The banana is obtainable in abundance at all seasons. In the winter months especially it provides an inexpensive food particularly needed in the diet which is often too low in fresh fruits and green vegetables.

All these facts show clearly that this remarkable fruit is a valuable addition to our staple food supply.

The development of the banana trade is one of the great romances of business. From small beginnings hardly more than a generation ago it has developed into a great industry, which is a potent factor in the commercial life of the countries producing and exporting the fruit. The industry has vast potentialities and the wider use of the banana is recognized by economists as an important factor in the problem of supplying the demand of an increasing world population for staple food.

What Are the Opportunities in Research in Home Economics?

(Continued from Page 36)

IN VIEW of the fact that a research person is not only expected to develop facts which are scientifically accurate, but also to put them in a form in which they will be usable by the housewife, some experience and training in writing is desirable. There should be associated with every research staff some one who knows the subject matter and also knows how to write, but it is helpful if the person doing the work can present the material in a practical, usable form. For this reason, we would recommend that wherever possible the person planning to go into research should get some training in presentation of subject matter.

Where should this training be obtained? Any good fundamental college course is a satisfactory foundation. If a person intends to go into home economics research, it is desirable that this should contain some home economics, since it helps to show the relationship of the science courses to home economics problems. Too high a degree of specialization is undesirable, and none should be entered into too early. During the last two years of college, however, the student who is interested in home economics research may narrow down her course sufficiently to get specialized work in home economics as well as more detail in the science or sciences concerned.

If this work can be had in an institution in which research is under way, so much the better, because a student does become interested in the problems and absorbs something from the atmos-

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Calumet contains two leavening units; one begins to work when the dough is mixed; the other waits for the heat of the oven—then both units work together. Gives you double value and a double safeguard against failure because it is

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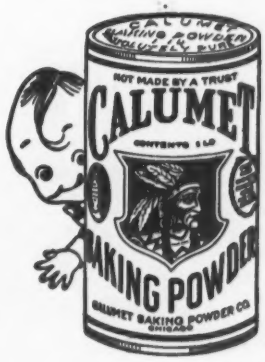

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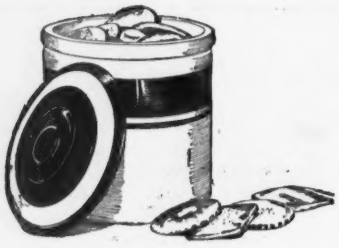

Making foods more healthful—more easily digestible—is often merely a matter of being sure that you use Royal Baking Powder.

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phere of research. It is better still if the undergraduate courses are taught from the experimental point of view. Following this, graduate work is desirable, though junior positions are usually open to college graduates. For a person seriously interested in research as life work, a junior position should not be accepted without graduate work unless it offers opportunity for training along with the research. A position that will allow the graduate student while earning to pursue a certain amount of graduate work is very desirable.

THE success of any research program is going to depend largely on the training and qualifications of the research workers. It has been suggested that the lack of development in home economics research has been due to lack of trained personnel. We have an opportunity in the records of the Purnell workers to compare the training of home economics people with that of people engaged in similar work in agriculture. Sybil L. Smith presented such a comparison at a recent meeting of the Land-Grant College Association in Chicago:

"The staff of research workers in home economics compares favorably with other departments of the stations. In his paper before the Experiment Station Section yesterday morning, Dr. E. W. Allen stated that of the present total number of station employees engaged in scientific work about 63 per cent hold advanced degrees, but that even with the inclusion of the doctors of science and agriculture and the veterinarians the number with doctors' degrees constitutes less than 25 per cent of the total workers. Of the home economics project leaders, 36 per cent hold a doctor's degree and 44 per cent a master's degree, making a total of 80 per cent (as compared with 63 per cent on the entire station staff) holding advanced degrees. I consider it a notable achievement that for the most part high standards of training and experience are being required for positions in this field. It is far better to relinquish funds temporarily for lack of suitable workers than to continue research under inadequate leadership."

Home economics has made a beginning and I think we may say a good beginning in research work. It is up to us now to see that the standard is maintained. In such a program every individual worker has a contribution to make. The institutions giving training in home economics should see to it that adequate courses are provided. The industrial and commercial groups interested in this field can make their contribution by calling to the attention of administrators of the colleges the needs for such workers, indicating where the workers now on the job are falling down and how their training needs to be supplemented, and these groups can lend support through fellowships in this field commensurate with that which has been developed in other lines.

Health Outline for First and Second Grade

(Continued from Page 42)

Lesson 5—COLDS.

Teacher's Aim: To teach the children the serious effects of a cold. Show how easy it is to give the cold to a playmate, and how to cure the cold.

Child's Aim: To learn why he should carry a handkerchief, and just where all these miserable colds come from anyway.

Procedure:

a. Discuss colds.
   1. Their effect on us.
      a. Sickness and expense.
      b. Loss of time and fun.
   2. Their effect on others around us—we must be careful by:
      a. Carrying a clean handkerchief.
      b. Sneeze into handkerchief.
      c. Turn head when coughing.
      d. Do not spit on floor or walk.
      e. Do not kiss anyone.
      f. Do not accept "bites" from anyone.

b. Cures for our colds.
   1. See our friend, the doctor, if possible.
   2. Follow our health habits.
      a. Plenty of fresh air.
      b. Plenty of exercise.
      c. Plenty of sleep.
      d. Drink lots of water.

Lesson 6—COLDS, Their Prevention.

Teacher's Aim: To teach the child the simple preventative measure by means of which it can avoid cold, and have better health.

Child's Aim: To learn how to avoid having colds.

Preparation:

Review the important facts learned about colds; discuss the cures, and how much better it would be to prevent them altogether.

Procedure:

a. How do we take colds?
   1. Contact with the disease.
   2. Low resistance—exposure.

b. How can we prevent colds?
   1. Avoid persons with colds.
   2. Do not eat or drink after anyone.
   3. Avoid undue exposure—keep feet dry.
   4. Build up strong power of resistance by
      a. Following health rules concerning fresh air, water, play, and sleep.
      b. Drink milk and eat nourishing foods.
   5. Toilet habits are important to health.